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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10,002,696	10/31/2001	Eliyahou Harari	11587 M-12336 US	4652

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EXAMINER

WEISS, HOWARD

ART UNIT PAPER NUMBER

2814

DATE MAILED: 07/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/002 696

Applicant(s)

HARARI ET AL

Examiner

Howard Weiss

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 13 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-25 ~~is/are~~ are pending in the application.
- 4a) Of the above claim(s) 1-12 ~~is/are~~ are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 13-25 ~~is/are~~ are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) 1-25 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 31 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6 6) ☐ Other:

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Attorney's Docket Number: M-12336 US

Filing Date: 10/31/01

Continuing Data: none

Claimed Foreign Priority Date: none

Applicant(s): Harari et al. (Samachisa, Yuan, Guterman)

Examiner: Howard Weiss

Election/Restrictions

1. The Applicants' election of Group II, Claims 13 to 25, in Paper No. 5 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 1 to 12 are withdrawn from consideration as being for a non-elected invention. The Applicants are requested to cancel the non-elected claims as part of a complete response to this office action. Cancellation of the non-elected claims would not preclude the later filing of a divisional application on the non-elected invention (please see 35 USC 120 and 121).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 13 is rejected under 35 U.S.C. 102(b) as being anticipated by Eitan (U.S. Patent No. 6,011,725).

Eitan shows all aspects of the instant invention (e.g. Figures 2 to 12) including:

- programming means (Column 12 Line 60 to Column 13 Line 33) supplying voltages to the gates **24**, source **14** and drain **16** regions to one of two threshold levels in a portion **23** of a charge storage dielectric **18** containing silicon nitride
- reading means for reading the programmed values as claimed (Column 13 Line 35 to Column 17 Line 30)

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 14, 15, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eitan and Reisinger (U.S. Patent No. 6,137,718).

Eitan shows most aspects of the instant invention (Paragraph 4) except for the storage of more than two defined ranges. Reisinger teaches (e.g. Figure 1) to store four (Column 7 Lines 25 to 30) or more (Column 6 Lines 5 to 35) ranges in a charge storage dielectric **52** in order to increase the storage density (Column 2 Lines 7 to 12). It would have been obvious to a person of ordinary skill in the art at the time of

invention to store four or more ranges in a charge storage dielectric as taught by Reisinger in the device of Eitan in order to increase the storage density.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eitan and Reisinger, as applied to Claim 14 above, and further in view of DiMaria (Journal de Physique 1981).

Eitan and Reisinger show most aspects of the instant invention (Paragraph 6) except for the charge storage dielectric including silicon rich silicon dioxide. DiMaria teaches (e.g. Figure 3) to use a charge storage dielectric including silicon rich silicon dioxide to produce a memory device with excellent breakdown characteristics (Page C4-1117 second paragraph). It would have been obvious to a person of ordinary skill in the art at the time of invention to use a charge storage dielectric including silicon rich silicon dioxide as taught by DiMaria in the device of Eitan and Reisinger to produce a memory device with excellent breakdown characteristics.

8. Claims 19 to 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (U.S. Patent No. 5,278,439) and Reisinger.

Ma et al. show most aspects of the instant invention (e.g. Figures 2 and 3) including:

- an array of memory cells **20**, **22** with elongated source and drain regions **20A**, **22A** within a substrate **26** and extending in a first direction and separated in a second direction perpendicular to said first direction
- a channel region **22** extending between said source/drain regions
- first and second conductive (control) gates **20C**, **22C** extending in said first direction and first and second storage elements **20B**, **22B**
- conductive word lines **28** extending in said second direction
- a select transistor gate **24A** positioned between said storage elements and coupled by a gate dielectric to the channel **24G**

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Ma et al. shows do not show the storage of more than two defined ranges using charge storage dielectric. Reisinger teaches (e.g. Figure 1) to store four (Column 7 Lines 25 to 30) or more (Column 6 Lines 5 to 35) ranges in a charge storage dielectric **52** in order to increase the storage density (Column 2 Lines 7 to 12). It would have been obvious to a person of ordinary skill in the art at the time of invention to store four or more ranges in a charge storage dielectric as taught by Reisinger in the device of Ma et al. in order to increase the storage density.

Conclusion


9. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. Papers should be faxed to Art Unit 2814 via the Art Unit 2814 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 308-7722** or **-7724**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications. The official TC2800 Before-Final, **(703) 872-9318**, and After-Final, **(703) 872-9319**, Fax numbers will provide the fax sender with an auto-reply fax verifying receipt of their fax by the USPTO.
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(703) 308-4840** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via **Howard.Weiss@uspto.gov**.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group 2800 Receptionist at **(703) 308-0956**.

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11. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/ 324, 326	7/12/02
Other Documentation: PLUS Analysis Report	7/10/02
Electronic Database(s): EAST, IEL	7/12/02



Howard Weiss
Patent Examiner
Art Unit 2814

HW/hw
15 July 2002